DOCUMENT RESUME

ED 191 143 EA 012 876

AUTHOR Hansen, Shirley J.
TITLE Energy Is Jamming the Locks to Excellence.
PUB DATE 19 Apr 80
NOTE 14p.: Paper presented at the Annual Meeting of the National Association of Elementary School Principals (Miami Beach, FL, April 19-23, 1980).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Administrators: *Building Operation: Cost Effectiveness: Efficiency: Elementary Secondary Education: *Energy Conservation: Fuel Consumption: Heating: Thermal Environment

ABSTRACT

Schools cannot pass on rapidly rising fuel costs by raising fees. While the price and availability of fuel remain out of the school administrator's hands, the administrator can influence the amount of fuel the school consumes. The administrator can manage four heat sources (heating plants, using conventional fuels, lights, people, and sun) and is faced with energy losses or gains through four processes (ventilation, infiltration of outside air, transmission of heat through building materials, and system inefficiencies). Great savings can be achieved through the use of common sense, but the educational purposes of the school must be considered along with the financial benefits of any conservation effort. Closing schools to save energy during crises may actually cause increased consumption in the community at large, as well as disrupting the normal flow of events in families that depend on their children being in school to permit the parents to work. Ending the school year early may provide more energy savings than a temporary mid-winter shutdown. Assessing the current situation and planning now for the immediate future are crucial if the administrator is to do an effective job of controlling the energy situation. (Author/PGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

S. J. Hansen

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED191143

ENERGY IS JAMMING THE LOCKS TO EXCELLENCE

Shirley J. Hansen

The theme of your 1980 convention, "Principals: The Key to Excellence," is most appropriate. Research has documented over and over again that the building principal is the single most important factor in attaining educational excellence. Principals are the ones who manage the building, set the educational climate, and work with teachers to see that good things happen for kids.

But I don't care how good you are, the most dedicated of principals cannot go it alone. You need resources. Books, dollars, lights, dollars, teachers, dollars ... The point is the tools of the trade cost money. Tight budgets eaten up by soaring energy costs are jamming those locks to excellence—and the best of keys won't be able to open them unless they get a handle on energy.

Remember the old debate you heard in grad school as to whether the principal was an educational leader or a manager. Well, energy is going to put that tired argument to rest once and for all because if you don't "manage" your energy situation, you are going to have very little left to "lead."

Which leads us to a look at the schools' present financial dilemma. I don't have to tell you about voter reluctance to increase educational revenues. And when any increased revenues are corrected for inflation, many districts have less spendable funds now than they did at the time of the oil embargo. That year, 1973, is a good base year for any discussion about energy because that's the year they speeded up the treadmill.

If you want to know where you are, start by comparing your district's or your building's 1973 budget to your present one in terms of its purchasing

EA 012 876

power. It's a simple process. First, develop a Consumer Price Index (CPI) ratio and then divide your 1973 budget by that ratio. This will give you how many dollars it will take today to pay for your 1973 supplies and personnel. Let's use an example of school district "A" with a $1,000,000 budget in 1973.

CPI ratio = 1973 CPI/1980 CPI (133/236) = .56

$1,000,000 ÷ .56 = $1,785,714

In the spring of 1980, district A needed nearly $1.8 million just to maintain its 1973 effort. The shocker is that many districts going through this exercise find that even though their revenues have increased they have not kept pace with inflation. Their "net revenue" is actually less. They are getting along on fewer real dollars. Moreover, this does not take into account increases in student populations or added demands on the budget like unemployment compensation or P.L. 94-142.

On top of this austere picture we lay the impact of soaring energy costs. Galloping energy escalation has hit the schools the hardest. Schools are the only sector of the economy — I repeat "the ONLY sector of the economy" — that cannot pass through their increased fuel costs by raising fees or adding costs to their product.

A few numbers will help it seem more real. The average cost of energy in 1973 was $20 per student. By the fall of 1979, the average cost was nearly $90 per student. And in the past year fuel prices have gone up as much as 50 percent. A straight line projection would suggest that in the fall of 1980 the schools could be paying as much as $135 per student. That's a 575 percent increase in just 7 years. Now it's not quite that clean because

schools fortunately have reduced consumption. Also more recently enrollments have been declining. These and other factors build in some distortion in the calculations.

But no matter how you slice it, school districts with little or no net revenue and increasing demands on those resources can tell you that every energy increase hurts. To put it another way, if education had just this past year's increased fuel costs in its pocket, it would equate to the current salaries of 109,000 teachers across the nation.

It's like a gigantic toothache. The sentiment of Prop 13 has eroded the protective revenue enamel, inflation and each new mandate has eaten through the dentine, now every jump in fuel prices brings a throbbing pain.

It's awfully hard to unlock doors to excellence when you are in pain.

Sure you can put it off or rationalize your way out of dealing with this issue. Energy seems like a gargantuan amorphous beast that no one person can get a handle on. But you don't have to deal with the whole beast. Your concern is for your education dollars going up your smokestacks.

There is ample evidence that the building manager, no matter what the business, is key to effective energy management. He has hands on responsibility. If it's going to get done, he must be involved. So there is a double-lock on the door to excellence—and you are the key to both.

It rests with you whether we continue to burn up precious education dollars or whether they stay in your grasp to help students learn.

As important as that choice is, principals are often apprehensive about

tackling ENERGY. There seem to be three major avoidance factors that deter principals: (1) time; (2) the conflict and confusion surrounding the energy situation; and (3) energy management seems to be so complex, cumbersome and mystical that it just has to be someone else's problem.

Let's take a look at each of these. First, time. Having been a principal I know you're busy, very busy, and the central office acts like everything should have been done yesterday, but time is a function of priorities. Hopefully, I can convince you that you can't afford not to give energy a high priority.

Secondly, the energy situation. As early as 1926 the Federal Fuel Oil Conservation Board said we had 6 years of proven reserves left. In 1939, the Department of Interior predicted we'd run out of oil in 13 years. Right after the oil embargo the Doomsday machine went into high gear cranking out one dire prediction after another. More recently, the National Geographic gave us pause by reporting 2500 years of natural gas left. The Ford Foundation study recently indicated we have plenty if we are just willing to pay for it. It is no wonder confusion abounds.

The conflict often rests in energy forecasting. Every forecast is based on a series of assumptions—the progress of technology, the effect of price on consumption, etc. Each assumption in turn is forecast—with more assumptions. Reminds me of the little Dutch girl on the box of Dutch Cleanser who held a box of Dutch Cleanser with a little Dutch girl who held... It just goes on and on. What you need to realize is how easily you can be distracted by the great debate. I've dubbed it the "fossil fuel finite fetish." Sure fossil fuels are finite. We need to be concerned, but if you

go too far down that road, you just may miss the more immediate problem... the one you must face when you get home. Today's energy dilemma turns on just two factors: price and availability. If energy were cheap and abundant, we would not have an "energy" problem.

We have already discussed what the impact of escalating fuel prices have had on school operations so far. But what does the future hold? Keeping in mind the old saying, "He who lives by the crystal ball must learn to eat broken glass," I will risk my digestive track and predict that in five years, by 1985, the cost of energy to our nation's schools will be at least three times what education is paying today. In other words don't wait for it to get better. It won't.

The other factor is availability. That can be translated into someone cutting back on your programs, your services, even closing your school because of reduced fuel supplies. I will come back to this later because you can do something about it. But you need a grounding in energy management first.

This is the heart of what I have to share with you today because it is the only aspect of our energy situation <u>you</u> can control. You can't control the price but you can control how much you have to buy. You can't control availability but you can control how much you need to keep schools open.

Which leads us to the third avoidance factor, the whole business of <u>energy management</u>.

The essence of energy management seems to have been obfuscated by a proliferation of pseudoscientific jargon. If you have been turned off by "retrofit," "energy budget," "maxi-audit," etc.—welcome to the club. Take comfort from Isaac Asinov who said, "Every small segment of the culture developes its own vocabulary for the sake of forming an in-group. There are a million verbal walls behind which fools cower."

You can be assured that there are a lot of fools swamping you with jargon who a year or two ago didn't know a Btu from a cup of coffee. They are cowering — and perpeturating — behind a bombardment of this verbiage.

Energy management is no more than good common sense. A short course in thermodynamics will clear the air. It all boils down to heat sources and energy losses/gains. Basically there are only four of each:

HEAT SOURCES	ENERGY LOSSES/GAINS
lights	ventilation
sun	infiltration
people	transmission
heating plants	system inefficiencies

Heat sources are rather self-explanatory. The one we tend to overlook, however, is the heat given off by people. Since schools are the most intensively populated industry going, this becomes immensely important when we consider closing schools to save energy.

On the energy losses/gains side, ventilation is the planned intake of outside

air while infiltration is the unintended admission of outside air. Unit ventilators, central air handlers, and fans are examples of ventilating equipment while the latter is the open door or leaks around the windows. Remember I mentioned common sense. Well think a minute, you know that every drop of air, intended or otherwise, that comes in the building has to be heated or cooled unless on one of those rare occasions the outside air is like baby bear's porridge, "Just right." Heating and cooling air takes a lot of energy. When you have children going out both ends of a long corridor to recess, they hold those doors open and you have built yourself a dandy wind tunnel. In effect, you are blowing textbooks and teachers' salaries right out the door. Common sense. Use one exit at a time. Another example, exhaust fans create vacuums. Not only do you expend energy running them but y ou induce outside air to fill the vacuum. We all know that!—if we think about it. Be sure fans are running only when needed in your building. Some exhaust fans could be wired to the light switch.

Transmission is the heat losses/gains through the walls, ceilings, floors. There is one simple rule: heat always runs down hill. If you don't want it to, you increase the resistance to its flow. Every building component has a resistance, or R factor. Put the pieces together, combining the R factors, you get a U factor. These factors are established. Given that figure your sixth graders could calculate how much heat is flowing through the walls of your building.

Finally, if a system is not working as efficiently as it was designed to do, it will expend unnecessary energy. New technologies may also improve on the old design.

A little logic goes a long ways. But there does come a point when more sophisticated concerns regarding the envelope or the systems will require professional help. Before you seek that help, you, your staff, and your students should do what can be done first. In fact, you and your staff—and common sense energy — can very often account for 20 percent of your potential savings.

Before anyone goes out to buy expensive professional services, you should have taken your own look around, conducted your own "mini-audit." To put it in educational parlance, you should do "See Spot Run" before you tackle War and Peace.

Check lists for self-help audits are easy to come by. Fortunately schools are very similar, and remedies often fit a pattern. The more common proven energy saving measures are:

1) reduce outside air intake—refurbish unit ventilators, be sure they are calibrated at state code; tighten the envelope —a little weatherstripping maintenance

2) adjust controls—make sure termostats really are set accurately; use automatic night set back properly; institute warm up cycles;

3) reduce excess lighting; replace lamps with more efficient ones; change fixtures and systems to more efficient ones

4) reduce glass—storm windows, multiglazing, reduce glass area

5) insulation--pipes, building structure--ceiling, roof, walls

6) automatic energy control systems—including reset devices and economizers

7) fuel plant modifications—burners, boilers, distributions systems, conversion to renewable or more abundant fuels

8) solar—particularly domestic hot water heating, swimming pool heating; and for major modification and new construction—passive solar

The list is by no means inclusive, but rather suggestive. Every school is unique. There are no cookbooks. Keep your thermodynamics course in mind and look for your own special opportunities.

Some things you do will be more cost-effective than others. That means for each dollar invested some things will save more per dollar. Obviously, there is a point of diminishing returns, both financially and educationally. From an economical point of view, funds invested in saving should be recovered in a short time. The longer the recovery on investment, or payback, the less attractive it becomes.

The educational aspect is critical. Think of all the energy you'd save if you never turned on the heat...or lights. Of course that dark cold room might not be the best learning environment, but the utility bill would be smaller. You need to keep before you the primary reason schools exist: to educate students. Reducing energy consumption at the expense of learning may be necessary in the face of limited supplies, but that is not conservation; it's curtailment.

I lose patience with administrators who think they are into energy conservation by removing so many light bulbs or tubes that the level of lighting is too low for good reading conditions. A light meter is an excellent investment. The trick is to use the energy that must be used as efficiently as possible. That's conservation. Using less than necessary for quality learning conditions is curtailment. Every educator should, must, know the difference.

Which brings us to the question of availability. The Department of Energy

by Congressional mandate is moving toward regulations that suggest States should consider closing schools as part of their emergency energy plans. Before you accept the surface logic of keeping food, health, safety sectors and industry (for economic stability) going while closing schools, you need to look a little closer.

All is not as it appears. The state departments of education in New York and North Carolina have both studied the situation. In such different climates, they both concluded that closing schools to save energy is probably counterproductive. You will recall that I mentioned earlier the importance of heat given off by people in our very intensively populated industry. People heat can often make up the difference between non-deterioration temperatures of 55^{o} and the temperature setting of 65^{o}. In closing schools we lose this advantage plus we send students to their separate homes to turn on TVs, cook lunch, and turn up the thermostats. Since approximately half of all school age children have mothers who work, many of those thermostats are turned down. When only the school plant is considered, the merits of closing schools to save energy is open to question. When the whole community is studied, the energy benefit could well be negative.

Closing schools will bring about the social and economic disruption in the community. Children will go unattended or mothers, often principle bread winners today, will be forced to stay home. Whether or not it saves energy, it will be the principals who get it in the neck from irate mothers. Pity the poor principal should it become known no energy was saved.

And I haven't even mentioned the educational losses the student will suffer. Or income you might lose.

The alternative is to get your facts together. What is the relative energy consumption for your school during Christmas vacation and the first week of return in January? How many homes in your attendance area are unoccupied during the day? With a little meter reading, help from your utility company and/or your community, you can come close to knowing in advance whether closing your school would save energy.

And if your preconceived notions haven't been shaken sufficiently for you to take a careful look, let me give you one more item. Given the construction of your building and the prevailing climate, you may save more energy by closing down in May than "extending vacations" in December-January. (See "A Case for May" in the July, 1977 issue of American School and University.)

I repeat: Get your data together. Advise your state energy office of your findings. They are anxious to build a sound energy contingency plan.

To face the energy situations coming your way, you need to start building immediate and long range plans. Start first with your education program--your goals and objectives. Begin to assign even crude energy values to programs and functions. Build a financial picture of your school or district and determine what energy has done and will do to your plans as costs escalate. Then set in motion financial and energy curtailment contingency plans. Consider possibilities in fuel oil options and what services and functions can first be reduced.

In the final analysis, if you don't have the information and the planned framework to make decisions, someone else will do it for you -- with or without supportive data. Who do you want running your show?

At about this stage of the game when I've painted a pretty bleak picture, someone always grabs for the last straw labeled, "exotic fuels." Alternative fuels aren't going to get us through tomorrow, or next year, or the next several years. In a few isolated instances they may help. For example, if you are into extensive renovation or new construction passive solar in many localities is a very attractive option.

Someday alternative fuels will probably do us a lot of good -- but "someday" is a few years down stream. We just can't get any massive effort on line soon enough. Indications are we could have a rough transition time ahead. This makes our conservation efforts all the more vital. They will buy time. Time to get the technology in hand. Time to bring new plants on line.

Clearly it is in the national interest and your professional interest to conserve. The situation is going to get much worse for you and the rest of us if you, if we, don't.

You hold the key not only to excellence but to education's future, for energy could well decide what that future will be.

At the risk of sounding macabre, I would like to close by sharing with you my frog story. Once upon a time in Biology 101, I was absolutely fascinated to find that you can put a frog in cold

water, gradually heat the water up, and cook the frog without it ever jumping out. Our energy situation is not unlike the frog's water. It's heating up. Fast! I hope you have gained enough insight into our mutual dilemma so you will have sense enough to jump...before you get cooked.